

VIRTUA WALKER '87



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<https://www.robinjss.co.uk/virtua-walker-87>

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The background of the slide is a pixelated landscape. The top half shows a sky with a small sun or moon in the center. The bottom half shows a green field with a fence line on the left and a path leading towards the horizon on the right. The entire image has a low-resolution, 8-bit aesthetic.

WHAT IS VIRTUA WALKER '87

OUTLINE

This document discusses the design and development of ***Virtua Walker '87***, an experimental VR installation. Initially conceived during Global Game Jam 17 in response to the theme 'waves', ***Virtua Walker '87*** is a critical parody game of technostalgia, VR, and the walking simulator genre.

In the game, players are tasked with walking along a virtual recreation of a real Scottish beach. They control their movement by physically walking on the spot, barefoot inside a custom, sand-filled controller. Player steps are captured by two force sensitive resistors that serve as inputs for the VR-based game. The game world is presented to the player in 2-bit colour (reminiscent of the Nintendo Game Boy) with 8-bit audio and purposefully constrained gameplay. Interaction is limited to walking and looking, with few points of interest along the 1.8-kilometer stretch of beach.



RESEARCH PREMISE

Virtua Walker '87 explores current nostalgia for period game technologies and consumer electronics. The installation is a playable critique of audience assumptions about VR and the walking simulator genre, informed by Hutcheon's theory of parody¹.

As a practice-based research project, *Virtua Walker '87* sought to explore a number of ideas around virtual reality and walking as a mechanic, including: how contemporary VR can be understood as a form of technostalgia; how VR as a technology often falls short of user expectations in terms of affordances and player control; and how the act of walking is understood and appreciated by players within the wider context of a videogame. Importantly, *Virtua Walker '87* aimed to explore dissonant aesthetics in games, contrasting rich tactile experience (the act of walking barefoot on natural materials) with the disenchantment that results from antiquated sound and graphics and a monotonous ludic interface.

The installation acts as a provocation to debate around the purpose of -and audience response to- virtual reality and emerging “immersive” technologies, and contributes to the discourse on walking simulators or “walkers” within Game Studies.

1. Linda Hutcheon. 1989. The politics of postmodernism. New York, NY: Routledge.



ORIGINALITY: RESEARCH BACKGROUND AND QUESTIONS

BACKGROUND

The current wave of virtual reality (VR) headsets – including the HTC Vive, Oculus Rift, PlayStation VR, and smartphone-based VR such as Google Daydream and Samsung Gear – has generated a great deal of developer and consumer interest, underpinned by both advancements in technology and the relatively affordable retail prices of VR options. Despite this interest, sales figures would suggest that consumer uptake of VR is slow, with one of the most popular units, the PlayStation VR, selling just 1 million units (of a PS4 install base of 60 million) by 2017¹.

VR is increasingly promoted as ‘the next big thing’ in consumer electronics, with applications not only in games but also in cinema, business, and advertising². But underlying the promotion of VR is an anxiety – particularly within the game development community – that mainstream uptake of home-based VR is unproven, and that VR as a consumer product is supported more by hype and expectation than concrete evidence that it is a commercially viable platform³.

This is particularly apparent within game design, with few examples of VR game ‘killer apps’. The cautious approach of game developers and publishers to VR could be linked to an appreciation of the technological failures of the past: games technologies that were touted as ‘the next big thing’ (including earlier experiments in VR), but which failed to demonstrate a satisfying user experience that matched the hype-driven consumer expectation.

1. Andrew Webster. 2017. PlayStation VR surpasses 1 million units sold. Retrieved June 15, 2017 from <https://www.theverge.com/2017/6/5/15719382/playstation-vr-sony-sales-one-million>

2. Ariel Shimoni. 2016. Why VR is the next big thing for brands. Retrieved June 12, 2017 from <https://techcrunch.com/2016/06/13/why-vr-is-the-next-big-thing-for-brands/>

3. Phil Iwaniuk. 2017. How, why, and when VR will fail. Retrieved June 12, 2017 from <https://www.pcgamesn.com/how-why-and-when-vr-will-fail>

RESEARCH AIM AND QUESTIONS

With this in mind, our focus was neither the viability of VR as a commercial platform, nor the quality of the VR user experience and game design today. Instead, our design research concerned our relationships with emerging or experimental technologies and, in particular, how consumer electronics often fail to live up to their hype and our own high expectations as users.

For our experimental VR installation game, we aimed to draw upon potential concerns and anxieties surrounding VR, and to use this as the background context for our playable critique of virtual reality as a medium for human-computer interaction.

Virtua Walker '87 is presented as a VR parody and a form of playable game criticism (or game-on-games⁴) that seeks to interrogate VR and game design on three fronts:

1. *How can contemporary VR can be understood as a form of technostalgia?*
2. *Why does VR as a technology often fall short of user expectations in terms of affordances and player control?*
3. *How is the act of walking understood and appreciated by players within the wider context of a videogame?*

4. Gabriele Ferri, Giovanni Caruso, Mauro Salvador, Riccardo Fassone, Stefano Gualeni. 2016. Games on games. Game design as critical reflexive practice GAME: The Italian Journal of Game Studies, 5 (2016).

RESEARCH QUESTIONS, CONTINUED

1. How can contemporary VR can be understood as a form of technostalgia?

Virtua Walker '87 is conceived and presented as a VR installation game that explores the nostalgic fetishisation of consumer electronics that promise to revolutionise home computing and digital gaming. To this end, the game draws upon the styling, tone, and broader consumer culture of 1980s computing to generate an atmosphere of technostalgia for consumer electronic curiosities. In particular, the game design and presentation references failed commercial releases, such as the Nintendo Virtual Boy.

2. Why does VR as a technology often fall short of user expectations in terms of affordances and player control?

Virtua Walker '87 explores how computer technology tends to fall short of user needs and expectations, generating frustration. It does this by deploying limited interaction, graphics, and audio that can be considered a parodic imitation of 1980s computer technology. The convoluted walking controller references the history of the game controller, and eschews functionally in favour of style.

3. How is the act of walking understood and appreciated by players within the wider context of a videogame?

As a parody of the walking simulator genre, ***Virtua Walker '87*** is controlled using a step-based controller, meaning that the player has to walk on the spot to control forward momentum in the game world. There are no other player inputs, other than rotation of the VR headset to control camera orientation. By providing an authentic walking experience and mechanic contrasted with unsatisfying graphics, sound, and gameplay, ***Virtua Walker '87*** provokes players to consider the act of walking in relation to their expectations and experience within a game world.

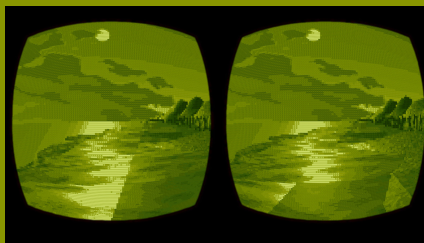
The background of the slide is a pixelated landscape. The top half shows a bright sun in a blue sky with some clouds. The bottom half shows a green field with a wooden fence in the foreground. The text is centered in the middle of the slide.

RIGOUR: RESEARCH AND DESIGN PROCESS

RESEARCH PROCESS

Following the creation of the first prototype at Global Game Jam 2017 in response to the theme 'waves', *Virtua Walker '87* was iterated on throughout 2017.

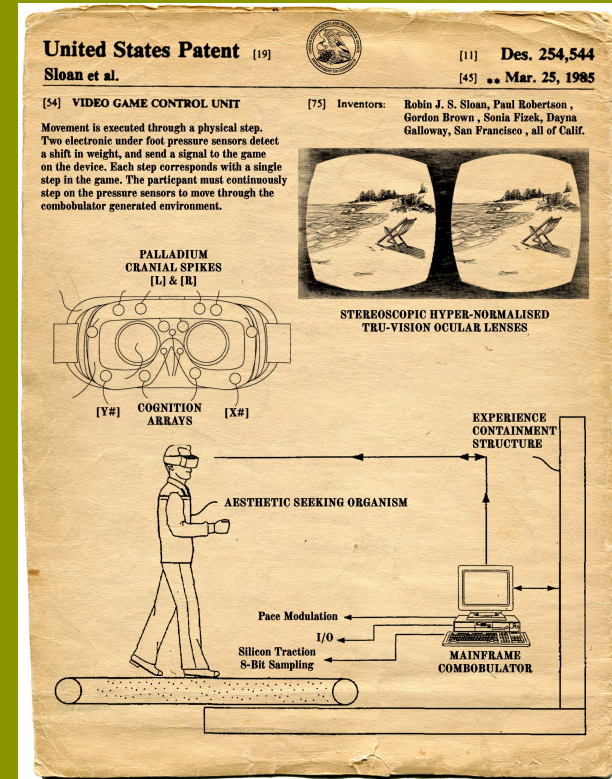
Our process involved iterative design, with sprints of game development (in Unity) and controller design followed by playtesting and evaluation.



HIGH CONCEPT: A LOST ARTEFACT

As a VR installation piece, *Virtua Walker '87* is presented as a fictional lost artefact: a near-mythical relic of 1980s consumer electronics that attracted a short-lived spike in interest and hype, but which suffered a subsequent collapse in consumer interest due to the poor user experience and a failure to develop the technology to a level that would make the product commercially viable. To this end, *Virtua Walker '87* can also be considered a parody of past games industry failures that have since become legendary, such as the burial and subsequent retrieval and sale of Atari E.T. cartridges.

In addition to the digital game and controller design, a fake history for the product was produced. This history is represented through period design work including adverts and manuals, as well as other documents including a fake US patent for the controller design.



HIGH CONCEPT: DESIGN MATERIALS



An experience so
real you'll forget
it's a game!

VIRTUA WALKER '87

Cyberspace is no longer limited to the silver screen or the shelves of your favourite comic book store. Now, you too can enter virtual reality!

Experience dazzling three-dimensional graphics and authentic surround sound in this latest technological marvel brought to you by the boffins at Aberlary Game Lab!

Strap on the revolutionary virtual reality visor, equipped with stereoscopic hyper-normalised Tru-Vision™ ocular lenses, and instantly you will be teleported to a series of Scottish beaches to explore!

USER INSTRUCTIONS

1. Step in front of the Virtua Walker foot-controller
2. Remove shoes and socks in order to maximise your experience using the Beach-Feedback device
3. Step forward into the Virtua Walker foot-controller, ensuring each foot is above the indicated pressure pads
4. Place the virtual reality visor over your head and adjust for comfort
5. Step repeatedly inside the Virtua Walker foot-controller to move within virtual world*

*Use of Virtua Walker may cause nausea, headaches, itchiness of the base of the skull, bowel irritation, loss of bladder control, short term memory loss, psychosis, tooth loss, nail loss, temporary blindness, and projectile vomiting. Should you exhibit any extended symptoms, a licensed A&E medic will act swiftly to normalise your condition. In the first instance, an emergency suppository will be used. If this fails to take effect, it may be necessary to proceed with a medically induced coma.

VIRTUA WALKER '87



HIGH CONCEPT: VR AND MONOTONY

As a game experience, *Virtua Walker '87* was conceptualized as *Proteus* meets the *Desert Bus* mini-game from the never-released game *Penn & Teller's Smoke and Mirrors*. From *Proteus*, we were inspired by the focus on walking and the player's dynamic aesthetic encounters with an abstracted natural world. We sought to combine these qualities with the relentless monotony of the player action and game levels in *Desert Bus*. To this end, *Virtua Walker '87* is a 1:1 scale walking simulator, in which players walk along picturesque Scottish beaches that, while aesthetically pleasing in reality, become mundane, long virtual walks when represented in VR: even more so when the audio-visual design strips away much of the richness of the natural environment.

As a continuation of our parodic approach to VR gameplay, we sought to take the concept of immersion beyond simply stepping to walk. As the game involves walking on virtual beaches, our controller was designed so that it could be filled with sand, whilst maintaining the functionality of the controller input.



Ludic X meets Y: *Proteus* (top) meets *Desert Bus* (bottom)

TECHNICAL DESIGN

Virtua Walker '87 was developed in Unity 5.5 and built to the Samsung Gear VR using Oculus Utilities. Development software included Autodesk Maya, Adobe Photoshop, and Sidtracker 64 for the development of music. The game was deployed on a Samsung Galaxy S7 Edge.

The main technical challenge was the development of the controller. As our high concept required direct physical interaction with the game world through the act of stepping, a custom controller needed to be constructed. Furthermore, as our design required the controller to incorporate a tactile element in the form of a sand base for the player to walk on, our two force sensitive resistors needed to discriminate between the weight of the sand placed on top of it and the shifting weight of the player as they walked on the spot (see concept diagram right).

Our solution was to begin with an Arduino board, which would process both player input and wireless communication with the Samsung Galaxy S7 Edge. Two force sensitive resistors were connected to the Arduino board. These were placed inside sealed plastic sheets, and then inserted into the base of the sandbox controller. The sealed plastic was necessary to protect the force sensitive resistors from the sand and other material that would be loaded into the box.

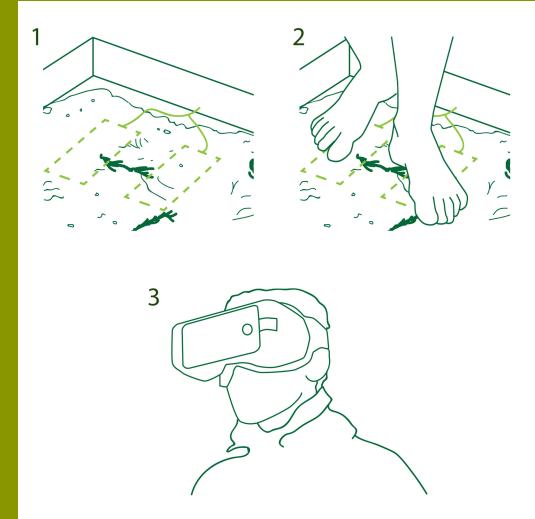


Diagram demonstrating the design concept for the controller: 1) two force sensitive resistors are embedded within the base controller, protected by a plastic sheet under a layer of sand, 2) the resistors are connected to an Arduino, which communicates shifts in player weight over Bluetooth, 3) the Samsung Gear VR receives the data over Bluetooth, and uses this data to drive player steps within the Unity build.

TECHNICAL DESIGN

In our initial prototype, the Arduino board was connected to a laptop using a Wi-Fi connection, and the laptop was then connected to the Samsung Galaxy S7 Edge using Bluetooth. This step was subsequently simplified by connecting the Arduino board to the Samsung handset directly over Bluetooth. This is the current set up, which has proven simple enough for quick installation when demonstrating the game at events.

In terms of calibration, the most important consideration was the weight of the sand and the subsequent detection of the player's weight. On activation of the application, the force currently applied on the resistors (by the sand in the box) is captured, making it straightforward to detect both when more force is applied, and when this force fluctuates (corresponding with a player shift in weight when walking on the spot).

Once we had developed the electronic solution, we proceeded to develop a custom-built controller base that would integrate the force sensitive resistors and Arduino board whilst also aligning without our objective of parodying technostalgia. Our final controller base – shown right – was assembled from hardwood and painted black. Our inspiration here was early 90s gaming controllers and consoles, particularly those developed by Sega.



LUDIC DESIGN

For the design of player interaction, the importance of the sandbox controller must be stressed. The intention with our installation is to present VR as a hypothetical 'better than reality' platform. Specifically, *Virtua Walker '87* is presented as a form of imagined virtual tourism from the late 1980s. The sand that is placed in the controller was sourced from the real beach featured in our first prototype: West Sands beach in St. Andrews, Fife. In most situations, we stress to players that they are to use the controller whilst bare foot, so they feel the 'real' sand from the beach that is represented within the VR headset.

This tactile feedback element of the installation plays a key part in our consideration of game levels. Our current design features three planned beaches, all from Fife in Scotland. West Sands beach is the easiest 'level', with soft sand and seaweed sourced for the sandbox. For the subsequent, more difficult levels, alternative boxes of sand should be swapped into the sandbox controller. The more difficult beaches are not only longer to walk, but also rougher in consistency: sharper sand, and more stones and pebbles.



LUDIC DESIGN

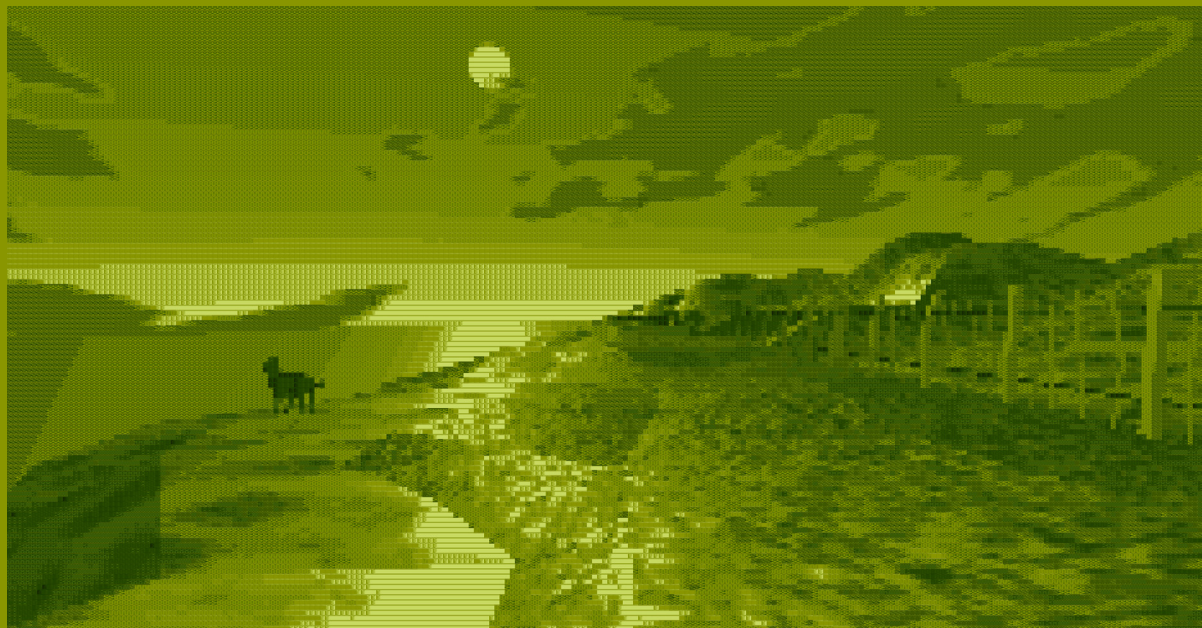
Given our inspiration from *Desert Bus*, the length of the beaches is also a critical factor. The image right shows how the introductory level, West Sands beach (St Andrews), was replicated to-scale in low resolution graphics. The emphasis here is on the monotony of the walk when this is emulated within a game world. The replication of a real beach in a game world draws attention to the act of walking as a game mechanic, contrasted with the aesthetics of walking as a pastime in the real world.



Aerial view of the recreation of West Sands beach rendered in Unity 5.5.2. The full length of beach created for this level was 1.8 km

AUDIO-VISUAL DESIGN

The in-game audio and visuals of *Virtua Walker '87* mimic computer technologies of the late 1980s. As designers we asked the question 'what if VR technology was deployed in 1987, but with graphics and audio similar to the original Nintendo Game Boy?' Our result is an imitation of 2-bit graphics (achieved by utilising a dither shader applied to the in-game camera), with SFX and music produced in chiptune style (composed in Sidtracker 64) and voiceover narration created using an online text-to-voice synthesiser.



The background of the slide is a pixelated landscape. The top half shows a bright yellow sun in a blue sky with white clouds. The bottom half shows a green field with a black fence on the left and a path leading towards the horizon. The text "GAMEPLAY VIDEO" is centered in the middle of the slide.

GAMEPLAY VIDEO

GAMEPLAY VIDEO



A gameplay sample from the West Sands level can be viewed at the following link: <https://vimeo.com/223285235>

More details can be accessed at: <https://www.robinjss.co.uk/virtua-walker-87>

Note that as a bespoke installation, the full experience cannot be played without the custom controller and designated VR set up. However, the Android .apk can be accessed from: <https://rke.abertay.ac.uk/en/publications/virtua-walker-87>



SIGNIFICANCE:

DISSEMINATION, INSTALLATION, AND ADDRESSING THE RESEARCH QUESTIONS

DISSEMINATION AND INSTALLATION

To date, *Virtua Walker '87* has been demonstrated at Global Game Jam 2017 (Dundee, UK), the IGDA Scotland Play Party (Dundee, UK), the Scottish Parliament (Edinburgh, UK) The International Conference on Game Jams, Hackathons, and Game Creation Events (Github HQ, San Francisco, CA), VIA Film and Transmedia, Filmby (Aarhus, Denmark), Perth Museum and Art Gallery (Perth, UK), the Edinburgh-based games festival, Games are For Everyone, at the V&A Dundee (2019), and at the Wandering Games conference in Bangor, Wales (2019).

Virtua Walker' 87 won the Best of Showcase award at the 2017 International Conference on Game Jams, Hackathons, and Game Creation Events.



SIGNIFICANCE: INTERNATIONAL REACH

Virtua Walker '87 was presented as an installation and discussed in a conference paper at GitHub HQ, San Francisco, February 2019.

Taking place as part of the wider Game Developers Conference (GDC) week, this allowed Virtua Walker '87 to be played and considered not only by academics, but also by games industry professionals in attendance for the largest annual industry event.

Presentation of *Virtua Walker '87* at GitHub HQ, San Francisco, CA (February 2017)



SIGNIFICANCE: IMMERSIVE TECHNOLOGIES

As a creative exploration of VR technology and audience engagement with VR, Virtua Walker '87 has been partially developed as a demonstrator as part of the **Create Converge** programme:

<https://createconverge.eu/pages/home>

Create Converge a European Interreg project that aims to support creative, digital and tech companies in the North Sea region.

Virtua Walker '87 has been used to demonstrate use of game engines and low-cost hardware in innovative uses of AR/VR for industry, which has included demonstration in Denmark and in the UK at events tied to the AHRC CICIP InGAME and the Scottish Parliament.

SIGNIFICANCE: SCHOLARSHIP ON WALKING

Virtua Walker '87 made a contribution to ongoing scholarship on walking, play, and walking simulators at the 2019 conference in Bangor, Wales, **Wandering Games**: <http://wandering-games-conference.bangor.ac.uk>

This conference presentation informed debate on nostalgia, anti-games, and the aesthetics of walking, as well as games as playable critique as outlined in the research paper **Nostalgia Games as Playable Games Criticism**: <https://rke.abertay.ac.uk/en/publications/nostalgia-videogames-as-playable-game-criticism-3>

Details of the conference talk can be accessed here:

<https://rke.abertay.ac.uk/en/publications/virtua-walker-87-step-into-the-past-in-a-2-bit-tinted-headset>

Presentation and Installation of *Virtua Walker '87* at Wandering Games Conference, Bangor, Wales (July, 2019)

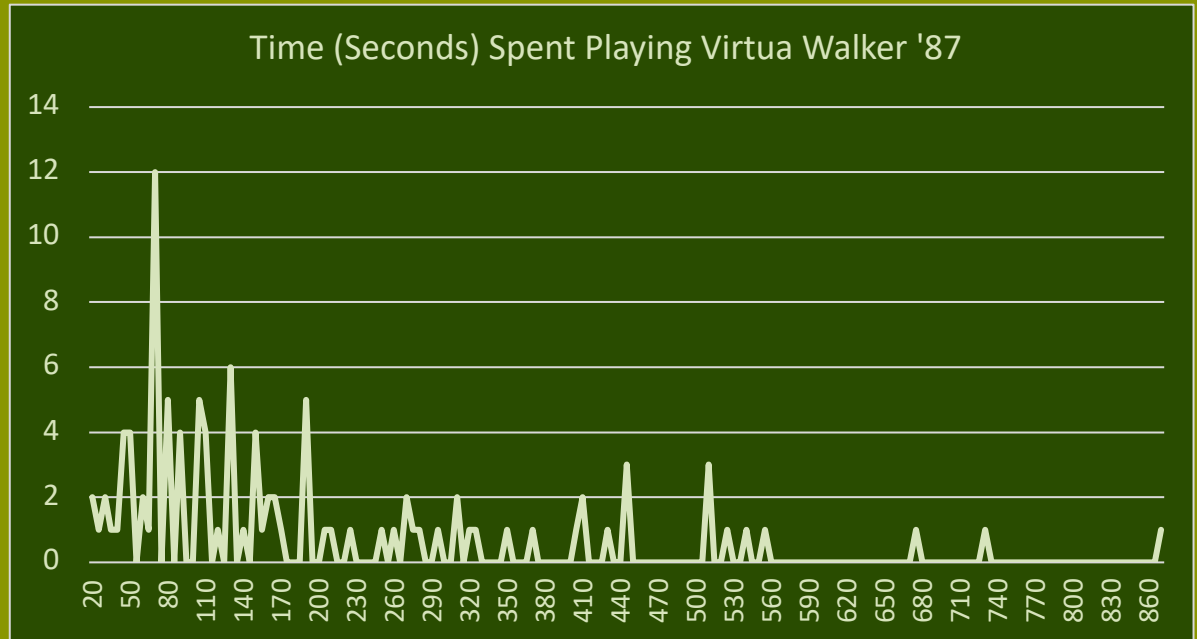


RESEARCH QUESTIONS: AUDIENCE FEEDBACK

- 1. How can contemporary VR can be understood as a form of technostalgia?*
- 2. Why does VR as a technology often fall short of user expectations in terms of affordances and player control?*
- 3. How is the act of walking understood and appreciated by players within the wider context of a videogame?*

In addition to exploring the above questions through practice and reflecting insights through the creation and installation of the artefact, audience feedback was collected from students, industry, academics, and the general public.

Feedback was collected at events where Virtua Walker '87 was installed in November 2017, May 2018, and July 2019.



This chart shows the time (seconds) spent playing Virtua Walker '87, from initiation to exit, for individual players. Data was collected from three events (Oct 17, May 18, Jul 19) from a total of 103 participants. The data suggests long periods of play (500 seconds or more) are outliers, with short periods of play (40-200 seconds) more common, and most play experiences lasting around 80-110 seconds.

RESEARCH QUESTIONS: AUDIENCE FEEDBACK

Through observation and live transcription of player feedback, qualitative data provided some additional insight into what players were experiencing. The following are example comments:

It's green (laughing)

This is not VR, my eyes are going to fall out (laughing)

I don't feel sick at all though, VR usually makes me
nauseous

Actually no I can't do anymore, it's too green (laughing)

Ok I can see something, this is the beach?

It doesn't look like a beach to me. Is that sound waves?

I'm stepping and is it meant to move?

Oh I see. I just do this over and over?

I didn't realise I could look behind me. How do I go a
different way?

I'm just walking.

It's so strange walking on sand.

Ok but not as strange as what I am looking at.

(Laughing)

Oh no (laughing)

Oh no no no, this is... (laughing)

Ok I'm going to keep on stepping

What are these things, is that a ball? It's a beach ball.

Oh my god (laughing)

A dog! Hello dog. It's not moving?

Bye dog. I guess I keep going

Now there is nothing.

When I look down I realise I have no feet, but I feel
sand. Oh no! (Laughing)

Get me out of here! (Laughing)

RESEARCH QUESTIONS: AUDIENCE FEEDBACK

Through observation and live transcription of player feedback, qualitative data provided some additional insight into what players were experiencing. The following are example comments:

This is so cool.
What's behind? Can I go that way?
This is familiar, this looks like a game I remember playing, but not green like this.
So I keep stepping, I see I'm getting closer to something.
It's like a game boy but 3D.
Oh I just noticed the sound is the sea.
What's going on, I can't tell what things are.
So the idea is I keep...
It's a dog! I wondered what that was.
Can I just stay here with the dog? He doesn't seem interested.
Keep moving, onward!
There are more things.
That's the grass, I just noticed the grass is moving in the wind. It was all pixels I didn't realise.

Oh no, this is not right. Is this right?
Where am I?
What am I doing here? This is ridiculous (laughing)
What's that? I can see something.
I don't know what it is.

I'm going to be sick already. I don't see anything. What a beautiful landscape. It's like I'm drunk. It's very pixelated. I'm now not sick, but my balance. I'm not moving really. I'm not experiencing it. I feel like an idiot. Don't tell me. Is it working? I'm dizzy.

RESEARCH QUESTIONS: AUDIENCE FEEDBACK

Through observation and live transcription of player feedback, qualitative data provided some additional insight into what players were experiencing. The following are example comments:

So if I walk on the spot, oh I really do. Is this because I'm connected to anything or is it on rails? Oh wow. I played a game with force play at super mag fest, there was a skateboard on force plates you had to jump, like just dance, it was crazy. It didn't work that well right. So what is the sky? It looks like another Earth. Can I turn all the way around? Oh I can awesome. Is it a real beach? Oh it's St Andrews I was thinking that, its the only beach in Scotland I know and I walked down it. The old nostalgia machine. Yeah maybe it was the fence post that gave it away. Would I be able to see buildings? Ah so I am at the end of it. I'm coming up against a lump. Is it a boat? I'm really in it, is it a rock? There are sounds? Oh it's birds. They look like a winged horse. Pegasus. So I'm looking at something that could be emerging in the distance. I'm in a particularly pixelated area. Oh another bird. The things that were buildings they have disappeared. There's kind of a heart in the sky now, it's flickering. What does the end look like, there is a box? I'm walking through a striped thing. Are the objects also in the same place? So when you say its accurate with the dunes, is that mapped? And this is 1:1 in the virtual world. And here are more boxes, and birds. It's almost like snowy? I like the designed ambiguity of simulated spaces, I think its a great concept, here with the pixelated shapes.

RESEARCH QUESTIONS: AUDIENCE FEEDBACK

Through observation and live transcription of player feedback, qualitative data provided some additional insight into what players were experiencing. The following are example comments:

The pixels universe changes your perception of everything. The funny things is I feel I'm staying in the same place but apparently I'm not. So that's the sea? I dont want to stuck out my hands in case I hit anyone. Is that a fence here? Is this based on a real beach. So you took pictures in real life? is that the sun or the moon? So it's day. Is that a technical limitation or choice? This does remind me of the GameBoy now in my earliest years. Is there an ending I'm working towards or am I going round and round? Is there a goal, I am walking towards that now? Maybe I don't know. It's like a workout. The fence is ending, or there is a hole here? It's broken here. I can feet on the base I've walked through the sand. It might be me, or it's getting more abstract. Oh these aren't buildings these are more hills. Yeah its definitely different.

The background of the slide is a pixelated landscape. The top half shows a bright yellow sun in a blue sky with white clouds. The bottom half shows a green field with a black fence in the foreground. The text is centered in a dark blue horizontal band.

ADDITIONAL INFORMATION AND CONTACT DETAILS

RESEARCH TEAM



Robin Sloan
Game Design / Art / Audio



Paul Robertson
Engine Development / Programming



Dayna Galloway
Art / Controller Design


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GAME LAB



VIRTUA WALKER '87



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